AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in this application:

LISTING OF CLAIMS:

Claims 1 to 20. (Canceled).

21. (Previously Presented) A method for interpolating at least two position-dependent, periodic analog signals that are phase-shifted with respect to one another and which are generated by scanning a measuring scale, comprising:

converting each of the analog signals into a digital data stream by a sigma-delta modulator;

generating a string of results by combining the data streams with correctional values and subsequently combining the data streams with one another;

generating from the string of results (a) new correctional values in accordance with a quality criterion that is to be satisfied during interpolation and (b) output signals of the interpolation;

accumulating over a specifiable time interval values of the string of results for generating the correctional values and the output signals; and

using a signal sequence generated by the accumulation as an address sequence for generating the correctional values and for generating the output signal.

22. (Previously Presented) The method according to claim 21, wherein the values of the string of results are accumulated in the accumulating step in a filter.

23. (Previously Presented) The method according to claim 22, wherein the filter includes an integrator.

24. (Previously Presented) The method according to claim 21, further comprising forming the address sequence by the accumulation, the address sequence including address values that represent phase information of the analog signals.

25. (Previously Presented) The method according to claim 24, wherein the output signals are generated in the output signal generating step from the address sequence by low-pass filtering and assignment of the address values.

26. (Previously Presented) The method according to claim 24, wherein the address values are a linear function of the phase of the periodic analog signals when the quality criterion is satisfied.

27. (Previously Presented) The method according to claim 21, where address values of the address sequence represent a phase value having a fractional proportion.

28. (Previously Presented) The method according to claim 27, wherein the correctional values are generated in the correctional value generating step in accordance with a high-value part of the address sequence, the high-value part corresponding to an integer proportion of the address values.

29. (Currently Amended) The method according to claim 27, wherein the output signals are generated in the output signal generating step in accordance with a ~~high-value~~ most-significant part and a ~~low-value~~ least-significant part of the address sequence, the ~~low-value~~ least-significant part corresponding to a fractional proportion of the address values, the ~~high-value~~ most-significant part corresponding to an integer proportion of the address values.

30. (Previously Presented) The method according to claim 21, wherein the output signals are generated recursively in the output signal generating step by generating new correctional values in accordance with the quality criterion and combining the new correctional values with the data streams until the quality criterion is satisfied.

31. (Previously Presented) The method according to claim 21, further comprising storing possible correction values as predefined values in an assignment unit.

32. (Previously Presented) The method according to claim 31, further comprising selecting the correction values to be combined with the data of the data streams in accordance with the quality criterion as a function of address values of the address sequence.

33. (Previously Presented) The method according to claim 21, wherein the correctional values correspond to values of a trigonometric function.

34. (Previously Presented) The method according to claim 21, wherein the analog signals are phase-shifted by 90° with respect to each other.

35. (Previously Presented) The method according to claim 21, wherein the analog signals are substantially sinusoidal.

36. (Previously Presented) The method according to claim 21, wherein the combining step includes multiplicatively combining individual data of the digital data streams with a respective correctional value and subsequently combining data of different data streams with one another by one of (a) addition and (b) subtraction.

37. (Previously Presented) The method according to claim 21, wherein individual data of the digital data streams each have a word width of one bit.

38. (Previously Presented) The method according to claim 36, wherein the combining step includes reducing the combination of two data of the digital data streams with the correctional values and with each other to one of (a) an additive and (b) a subtractive combination of two correctional values.

39. (Previously Presented) The method according to claim 38, wherein the combining step includes combining the combination to one of four possibilities of the combination of the correctional values by one of (a) addition and (b) subtraction.

40. (Previously Presented) A device for interpolating at least two position-dependent, periodic analog signals that are phase-shifted with respect to each other and which are generated by scanning a measuring scale, comprising:

a sigma-delta modulator configured to convert the analog signals to a respective digital data stream;

an arithmetic unit configured to generate a string of results in accordance with a combination of the data streams with correctional values and in accordance with subsequent combination of the data streams with one another;

an arrangement configured to generate, from the string of results, (a) new correctional values in accordance with a quality criterion that is to be satisfied during the interpolation and (b) output signals of the interpolation;

a filter configured to accumulate values of the string of results over a specified time interval to generate an address sequence to control the arithmetic unit to guide the string of results to satisfy the quality criterion; and

an evaluation circuit post-connected to the filter configured to convert address values of the address sequence into output values of the interpolation.

41. (Previously Presented) A method for interpolating at least two position-dependent, periodic analog signals that are phase-shifted with respect to one another and which are generated by scanning a measuring scale, comprising:

converting each of the analog signals into a digital data stream by a sigma-delta modulator;

generating a string of results by combining the data streams with correctional values and subsequently combining the data streams with one another;

generating from the string of results a combination output in accordance with a quality criterion that is to be satisfied during interpolation;

accumulating over a specifiable time interval values of the combination output for generating the correctional values and output signals; and

using a signal sequence generated by the accumulation as an address sequence for generating the correctional values and for generating the output signal.

42. (Previously Presented) A device for interpolating at least two position-dependent, periodic analog signals that are phase-shifted with respect to each other and which are generated by scanning a measuring scale, comprising:

a sigma-delta modulator configured to convert the analog signals to a respective digital data stream;

an arithmetic unit configured to generate a string of results in accordance with a combination of the data streams with correctional values and subsequent combination of the data streams with one another;

an arrangement configured to generate, from the string of results a combination output in accordance with a quality criterion that is to be satisfied during the interpolation;

a filter configured to accumulate values of the combination output over a specified time interval to generate an address sequence to control the arithmetic unit to guide the string of results to satisfy the quality criterion; and

an evaluation circuit post-connected to the filter configured to convert address values of the address sequence into output values of the interpolation.